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XXXVIII.—*Description of* Orbitolites Malabarica (*H. J. C.*), *illustrative of the Spiral and not Concentric Arrangement of Chambers in D'Orbigny's Order Cyclostègues.* By H. J. Carter, Esq., Assistant Surgeon, Bombay Establishment.

[With a Plate.]

Orbitolites Malabarica (H. J. C.).

Description.—Free, discoidal, thin, plane or slightly concave on one side and convex on the other, smooth; presenting spiral lines on the surface extending from the centre to the circumference. Margin thick, round, rugoso-reticulate longitudinally, with one or more pores in the interstices; each pore being surrounded by a raised rim or border. Size, 1–30th of an inch thick at the circumference; 7 to 8–12ths of an inch in diameter (Plate XVI. B. figs. 1 & 3).

Internal Structure.—Composed of several layers of chambers, which are formed of as many turns of an inclined plane in a vertical spire; covered externally by a thin incrustation, through which the chambers may be seen with a magnifying glass of low power. Chambers arranged in *continuous* spiral rows extending from the centre to the circumference, and increasing in number outwards (fig. 2); alternate in adjoining rows, small in the centre, largest towards the circumference, and in the superficial layer on both sides, where they are oblong or ovoid vertically (fig. 4); each presenting two round apertures communicating with the next outer and inner chambers; the outer aperture of the external row opening on the margin (fig. 3). Septa straight (and being perpendicular to the, and alternate in adjoining, rows of chambers), forming *broken* spiral lines running in the opposite direction to them, so as to present the linear appearance seen on the case of an engine-turned watch (fig. 2); but with the exception, that in the former the lines increase in number outwards

by the addition of more rows of chambers on the one hand, and more septa on the other, just as in *Orbitoides*. D'Orbigny's "coupe horizontale," therefore, of the latter (Cours élément. de Paléont. et Géol. vol. ii. p. 193) is not correct, for that is identical with the lines on the back of an engine-turned watch.

Locality.—Abounding in an impure, bluish-green limestone (of the Pleiocene of formations) about 30 feet beneath the surface at Cochin on the Malabar coast, the shells of which, though deprived of their animal matter, are still white and pulverulent, or semicrystalline.

Observations.—In my "Descriptions of some of the larger forms of Foraminifera in Scinde," p. 161 of this Journal, I have stated, that "D'Orbigny is not warranted in giving the distinguishing character of concentricity to the rows of chambers in his order *Cyclostègues*, for in his three first genera, which are all alike in this respect, we have seen that it is almost impossible to determine it; and in his last one, of which *Lycophris dispansus* is a type, it is evident that this is not the case, but, that the chambers are arranged subspirally."

I had always been impressed with the idea that a spiral arrangement of the chambers was the most persisting character in the discoidal Foraminifera, and although I had succeeded in demonstrating this in *Orbitoides* (*loc. cit.*), I could not do so in the other genera of D'Orbigny's *Cyclostègues*, from the smallness of the cells and their confusion in the centre of the species I possessed. In the one just described however, there is no doubt of it. The lines of chambers are thrown off from a vertical spire, in the form of sparks from a rotatory fire-work, as I have before stated of *Orbitoides*; and, if it be the case in one species of *Orbitolites*, it is most probably the case in all, and in D'Orbigny's genus *Orbitolina* also, which is but an extended form of the same structural foundation.

Hence if this reasoning be allowed, it must follow, that D'Orbigny's term for this order is a misnomer, for the chambers are not arranged in concentric circles as it would imply, but *spirally*, as in other discoidal Foraminifera.

I have named this species *Orbitolites Malabarica* from its locality, the specific differences between it and the other known species (with the exception of the spiral lines on the surface) not being recognizable by the unassisted eye.

Identity of Lamarck's *genus Orbitolites and* D'Orbigny's *Cyclolina*.—There appears to me to be very little difference between Lamarck's genus *Orbitolites* and D'Orbigny's *Cyclolina*, judging from the figures of the former, in tab. 73. figs. 13–16, of Lamouroux's 'Exposition Méthodique des Polypiers,' and of the latter, in tab. xxi. figs. 22–25, of D'Orbigny's 'Foramen.

Foss. du Bassin Tert. de Vienne.' Both are marginoporous, and both without pores on the surface (Carpenter, Quart. Geol. Journ. vi. p. 31); while the concentric circles represented in D'Orbigny's *Cyclolina cretacea* (*loc. cit.*) find their parallel also in Lamarck's *Orbitolites concava*. Carrying out this reasoning also, we find it stated by Dr. Carpenter (*loc. cit.*) respecting the Australian species of Quoy and Gaimard and *Orbitolites complanata*, that they "agree closely in every particular save the form of the superficial cells;" and as the former and *Orbitolites Malabarica* will be seen to be still more intimately allied, it also follows, that all these species should come under the genus *Orbitolites* of Lamarck. The chambers I apprehend are arranged spirally in all, though the superficial lines only appear to be so in *O. Malabarica*.

It therefore seems to me (though of course I make the remark with much deference) that D'Orbigny's genus *Cyclolina* should be a species in Lamarck's *Orbitolites*; then the latter genus would be characterized by a thin amorphous incrustation on the surface through which the chambers are more or less visible with a magnifying glass; and in D'Orbigny's *Orbitolina*, the incrustation would be characterized by its cellular structure, as in *Orbitoides*, rendering the species or varieties more or less convex on one or both sides. In this case the species in the "Descriptions, &c." to which I have alluded, called respectively *Cyclolina* and *Orbitolites*, should be called *Orbitolites* and *Orbitolina*.

Bombay, February 26, 1853.

EXPLANATION OF PLATE XVI. B.

Fig. 1. *Orbitolites Malabarica*, natural size.
Fig. 2. Portion of the centre magnified, showing the spiral arrangement of the chambers.
Fig. 3. Portion of the margin magnified, showing the marginal apertures.
Fig. 4. Portion of the internal, or opposite, side of the rows of chambers, showing similar apertures;—also the large oblong or ovoid chambers of the surface.

XXXIX.—*Remarks upon British Plants.*

By Charles C. Babington, M.A., F.R.S., F.L.S. &c.*

[Concluded from p. 368.]

6. Myosotis alpestris.

Having had occasion to refer to the *Myosotis alpestris*, it may be allowed, and indeed seems desirable, to take this opportunity of

* Read before the Botanical Society of Edinburgh, April 14, 1853.